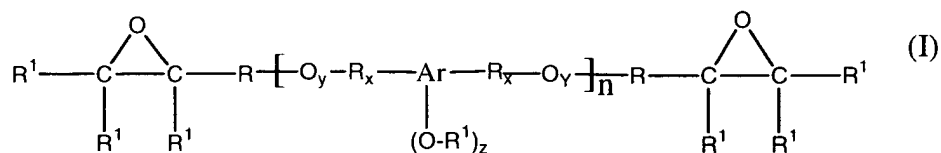


CLAIMS

1. A curable adhesive composition for anchoring materials in or to concrete or masonry comprising:
 - a. a polymerizable vinyl ester comprising the reaction product of an epoxy compound and a compound containing an ethylenically unsaturated group, said epoxy compound corresponding to formula (I),



wherein

Ar is substituted or unsubstituted aryl.

R is substituted or unsubstituted divalent radical derived from alkyl, oxyalkyl, arylalkyl, or oxyalkylaryl, alkyl or arylalkyl,

R¹ is independently H or R,

for each R_x, x is independently 0 or 1,

for each O_y, y is independently 0 or 1,

for each (O-R²)_z, z is independently 0 to 4,

x, y and z is each independently 0 to 5 provided that x and y can not both be zero, and n is from about 1 to about 5;

- b. a substantially styrene free, ethylenically unsaturated monomer reactive with said polymerizable vinyl ester;
 - c. curing catalyst; and
 - d. activator.

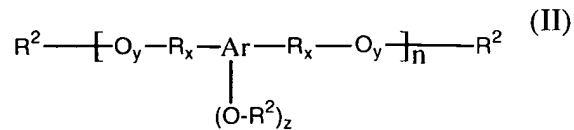
2. The adhesive composition of claim 1 wherein said polymerizable vinyl ester is present in the composition in amounts of from about 10 wt% to about 30 wt% of the composition.
3. The adhesive composition of claim 1 wherein said polymerizable vinyl ester is present in the composition in amounts of from about 10 wt% to about 25 wt% of the composition.
4. The adhesive composition of claim 1 wherein said polymerizable vinyl ester is present in the adhesive composition in amounts of from about 70 pbwa to about 95

pbwa.

5. The adhesive composition of claim 1 wherein said polymerizable vinyl ester is present in the adhesive composition in amounts of from about 85 pbwa to about 95 pbwa.
6. The adhesive composition of claim 1 wherein said ethylenically unsaturated monomer comprises vinyl toluene.
7. The adhesive composition of claim 1 wherein said the weight ratio of vinyl ester to said reactive diluent is from about 0.8 to about 3.
8. The adhesive composition of claim 7 wherein said ethylenically unsaturated monomer comprises vinyl toluene.
9. The adhesive composition of claim 8 wherein said ethylenically unsaturated monomer consists essentially of vinyl toluene.
10. The adhesive composition of claim 1 wherein said the weight ratio of vinyl ester to said reactive diluent is about 0.8 to about 1.5.
11. The adhesive composition of claim 10 wherein said ethylenically unsaturated monomer comprises vinyl toluene.
12. The adhesive composition of claim 11 wherein said ethylenically unsaturated monomer consists essentially of vinyl toluene.
13. The adhesive composition of claim 1 having a pull out performance at one hour at a temperature of 23°C of at least about 60 KN.
14. The adhesive composition of claim 1 having a pull out performance at about 24 hour at a temperature of 23°C of at least about 70 KN.
15. The adhesive composition of claim 1 having a pull out performance after about 24 hours at a temperature of 80°C of at least about 45 KN.

16. A curable adhesive composition for anchoring materials in or to concrete or masonry comprising:

- 5 a. polymerizable vinyl ester corresponding to formula (II),



15

wherein

Ar is substituted or unsubstituted aromatic radical with a valence of at least two, R is independently a substituted or unsubstituted divalent radical derived from alkyl, oxyalkyl, arylalkyl, or oxyalkylaryl,

20

R² is independently H, substituted or unsubstituted vinyl carboxy radical, substituted or unsubstituted epoxy radical, or R, provided that the ratio of n to the number of vinyl carboxy R² groups is, on average for the composition, from about 0.4 to about 2.0,

for each R_x, x is independently 0 or 1,

25

for each O_y, y is independently 0 or 1,

for each (O-R²)_z, z is independently 0 to 4, provided that at least one y must not be zero if z is zero, and

n is from 1 to 5;

30

- b. an ethylenically unsaturated monomer reactive with said polymerizable vinyl ester;

- c. curing catalyst; and

- d. activator.

35

17. The adhesive composition of claim 16 wherein said polymerizable vinyl ester is present in the composition in amounts of from about 10 wt% to about 30 wt% of the composition.

40

18. The adhesive composition of claim 16 wherein said polymerizable vinyl ester is present in the composition in amounts of from about 10 wt% to about 25 wt% of the composition.

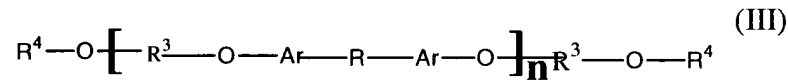
19. The adhesive composition of claim 16 wherein said polymerizable vinyl ester is

present in the adhesive composition in amounts of from about 70 pbwa to about 95 pbwa.

- 5 20. The adhesive composition of claim 16 wherein said polymerizable vinyl ester is present in the adhesive composition in amounts of from about 85 pbwa to about 95 pbwa.
- 10 21. The adhesive composition of claim 16 wherein said ethylenically unsaturated monomer comprises vinyl toluene.
- 15 22. The adhesive composition of claim 16 wherein said the weight ratio of vinyl ester to said ethylenically unsaturated monomer is from about 0.8 to about 3.
- 20 23. The adhesive composition of claim 22 wherein said ethylenically unsaturated monomer comprises vinyl toluene.
- 25 24. The adhesive composition of claim 23 wherein said ethylenically unsaturated monomer consists essentially of vinyl toluene.
- 30 25. The adhesive composition of claim 24 wherein said the weight ratio of vinyl ester to said ethylenically unsaturated monomer is about 0.8 to about 1.5.
- 35 26. The adhesive composition of claim 25 wherein said ethylenically unsaturated monomer comprises vinyl toluene.
- 40 27. The adhesive composition of claim 26 wherein said ethylenically unsaturated monomer consists essentially of vinyl toluene.
28. The adhesive composition of claim 16 having a pull out performance at one hour at a temperature of 23°C of at least about 60 KN.
29. The adhesive composition of claim 16 having a pull out performance at about 24 hour at a temperature of 23°C of at least about 70 KN.
30. The adhesive composition of claim 16 having a pull out performance after about 24 hours at a temperature of 80°C of at least about 45 KN.

31. A curable adhesive composition for anchoring materials in or to concrete or masonry comprising:

a. polymerizable vinyl ester corresponding to formula (III),



wherein

Ar is substituted or unsubstituted aromatic radical with a valence of at least two,

R is independently a substituted or unsubstituted divalent radical derived from alkyl or arylalkyl,

R³ is a hydroxy substituted divalent radical derived from an alkyl radical,

R⁴ is independently a vinyl carboxy radical or an epoxy radical, or R, provided that the ratio of n to the number of vinyl carboxy R⁴ groups is, on average for the composition, from about 0.4 to about 2.0, and

n is from 1 to 5;

b. an ethylenically unsaturated monomer reactive with said polymerizable vinyl ester;

c. curing catalyst; and

d. activator.

32. The adhesive composition of claim 31 wherein said polymerizable vinyl ester is present in the composition in amounts of from about 10 wt% to about 30 wt% of the composition.

33. The adhesive composition of claim 31 wherein said polymerizable vinyl ester is present in the composition in amounts of from about 10 wt% to about 25 wt% of the composition.

34. The adhesive composition of claim 31 wherein said polymerizable vinyl ester is present in the adhesive composition in amounts of from about 70 pbwa to about 95 pbwa.

35. The adhesive composition of claim 31 wherein said polymerizable vinyl ester is present in the adhesive composition in amounts of from about 85 pbwa to about 95 pbwa.

36. The adhesive composition of claim 31 wherein said ethylenically unsaturated monomer comprises vinyl toluene.

5

37. The adhesive composition of claim 36 wherein said weight ratio of vinyl ester to said ethylenically unsaturated monomer is from about 0.8 to about 3.

10

38. The adhesive composition of claim 37 wherein said ethylenically unsaturated monomer comprises vinyl toluene.

15

39. The adhesive composition of claim 38 wherein said ethylenically unsaturated monomer consists essentially of vinyl toluene.

20

40. The adhesive composition of claim 31 wherein said weight ratio of vinyl ester to said ethylenically unsaturated monomer is about 0.8 to about 1.5.

25

41. The adhesive composition of claim 40 wherein said ethylenically unsaturated monomer comprises vinyl toluene.

42. The adhesive composition of claim 41 wherein said ethylenically unsaturated monomer consists essentially of vinyl toluene.

30

43. The adhesive composition of claim 31 having a pull out performance at one hour at a temperature of 23° C of at least about 60 KN.

35

44. The adhesive composition of claim 31 having a pull out performance at about 24 hour at a temperature of 23°C of at least about 70 KN.

45. The adhesive composition of claim 31 having a pull out performance after about 24 hours at a temperature of 80°C of at least about 45 KN.